

NAME: _____

DATE: _____

Unit-2 Mastery Assessment (version 636)

Question 1 (10 points)

Let f represent a function. If $f[20] = 50$, then there exists a knowable solution to the equation below.

$$y = \frac{f[4(x - 9)]}{2} - 8$$

Find the solution.

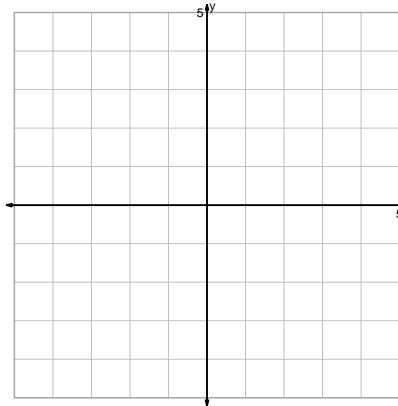
$x =$

$y =$

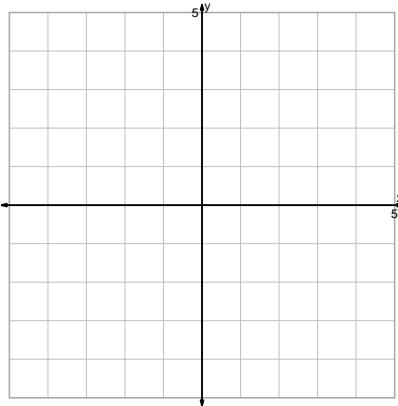
Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

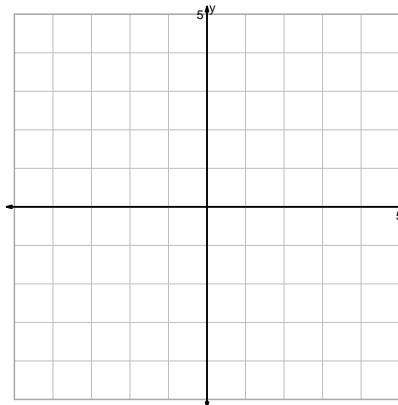
$$y = 2 \cdot x^3$$



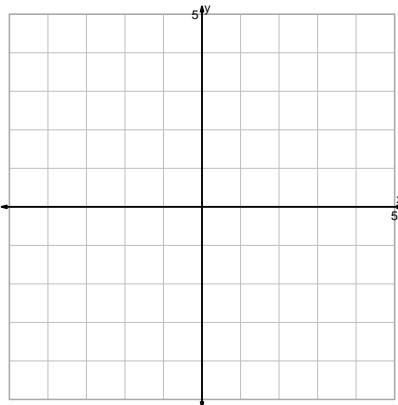
$$y = \log_2(x + 2)$$



$$y = \sqrt{2x}$$

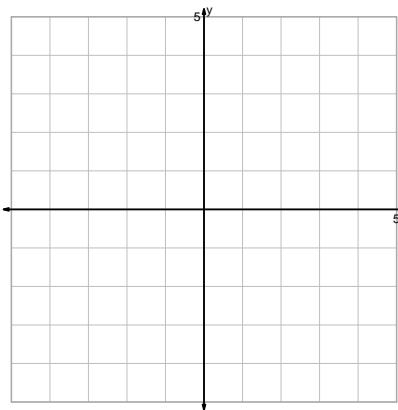


$$y = -\sqrt{x}$$

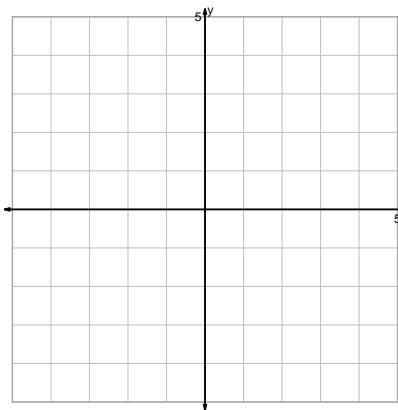


Question 2 continued...

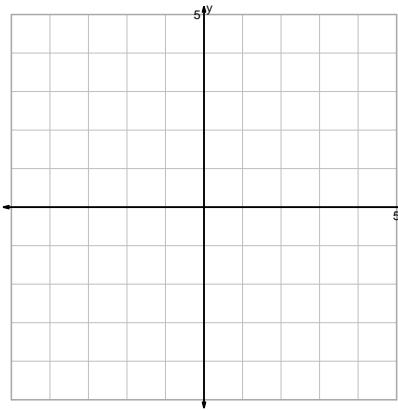
$$y = \sqrt[3]{\frac{x}{2}}$$



$$y = \log_2(-x)$$

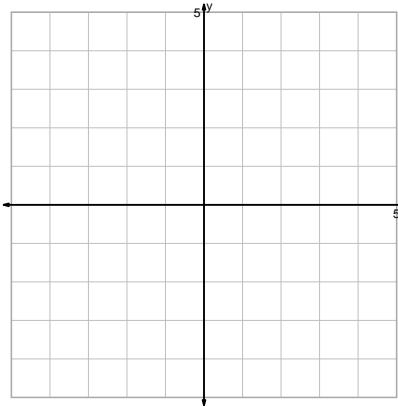


$$y = (x - 2)^2$$

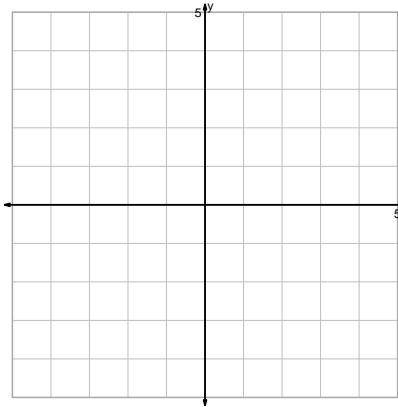


$$y = x^2 + 2$$

$$y = \frac{2^x}{2}$$

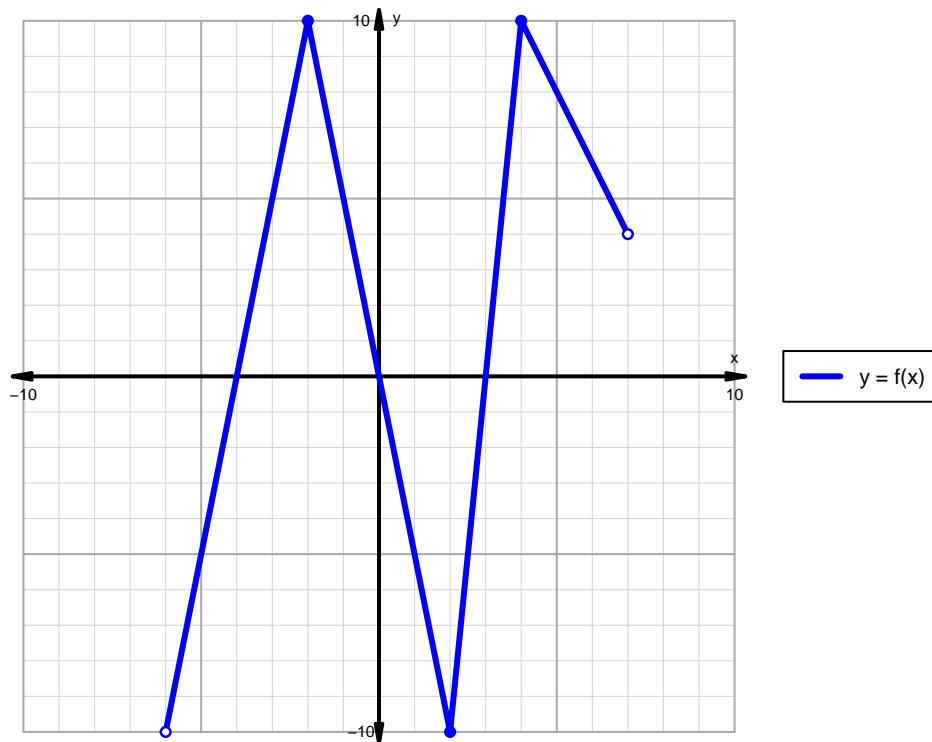


$$y = \sqrt[3]{x} - 2$$



Question 3 (20 points)

A function is graphed below.



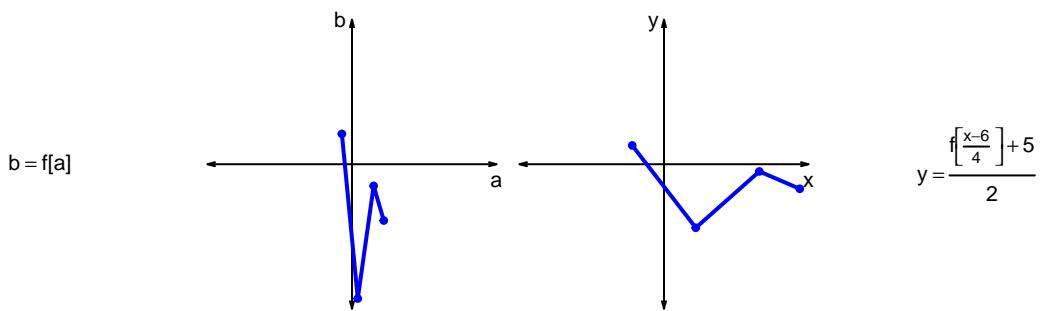
Indicate the following intervals using interval notation.

| Feature | Where |
|------------|-------|
| Positive | |
| Negative | |
| Increasing | |
| Decreasing | |
| Domain | |
| Range | |

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = \frac{f[\lceil \frac{x-6}{4} \rceil] + 5}{2}$ are represented below in a table and on graphs.

| a | b | x | y |
|----|-----|-----|-----|
| -7 | 21 | -22 | 13 |
| 4 | -93 | 22 | -44 |
| 15 | -15 | 66 | -5 |
| 22 | -39 | 94 | -17 |



- a. Write formulas for calculating x from a and calculating y from b . (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = \frac{f[\frac{x-6}{4}] + 5}{2}$?

Question 5 (10 points)

A parent square-root function is transformed in the following ways:

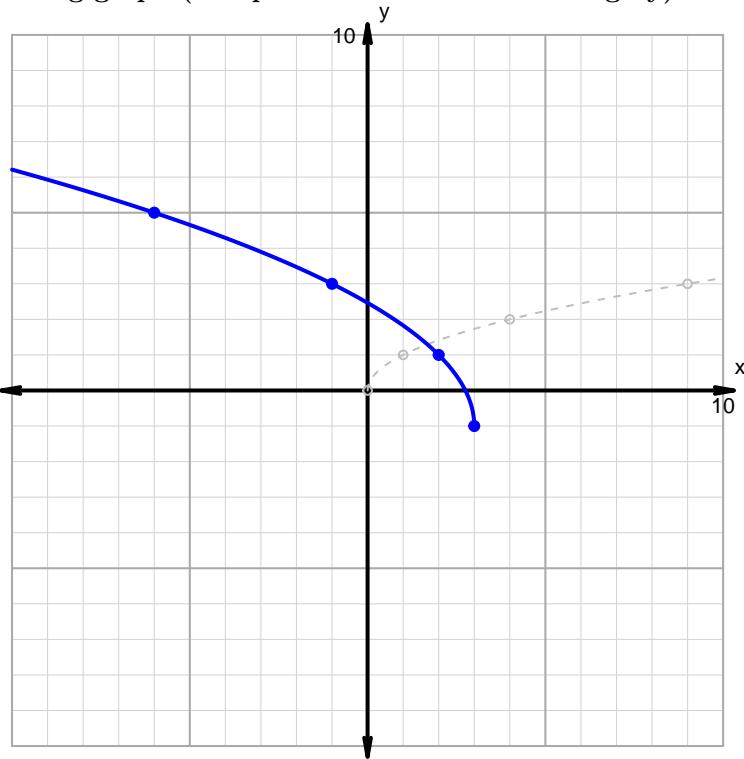
Horizontal transformations

1. Horizontal reflection over y axis.
2. Translate right by distance 3.

Vertical transformations

1. Vertical stretch by factor 2.
2. Translate down by distance 1.

Resulting graph (and parent function in dashed grey):



- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = -3 \cdot |x - 7| + 6$$



| Feature | Where |
|------------|-------|
| Domain | |
| Range | |
| Positive | |
| Negative | |
| Increasing | |
| Decreasing | |